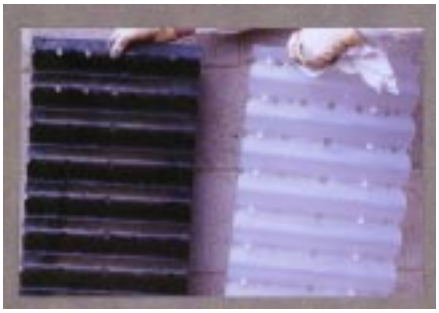
Naval Research Laboratory
Environmental Quality Sciences

# Environmental Quality Sciences
# Chemistry Division
# U.S. Naval Research Laboratory

## Environmentally Sound Fleet - Oil/Water Separators

To operate ships in compliance with state, federal and international laws applying to oily waste discharge, parallel plate oil/water separators (OWSs) are used to remove petroleum products (i.e., hydraulic fluid, lubricating oils, etc.) from shipboard oily bilge water. The oily waste is retained aboard and the "clean" water is discharged overboard. OWSs are currently being installed on most Navy ships, with completion expected by CY2000.

Over time, a build-up of oily sludge accumulates in the OWS, decreasing the efficiency of processing the oily bilge water. Periodic removal and hand cleaning of the polypropylene plates ensures that the separator's effluent will comply with the oily waste discharge regulations contained in OPNAV Instruction 5090.1A (2 Oct 1990). Hand cleaning of the OWS is a labor intensive, costly task that can expose personnel to toxic/ hazardous sludge (i.e., heavy metals such as cadmium and mercury, as well as, copper, nickel, zinc and vanadium accumulate in the oily sludge) and hydrogen sulfide gas generated as a result of anaerobic conditions within the tank.



This project supported the Tri-Service Environmental Quality Strategic Plan under Thrust 2.G.1, Tri-Service Requirement 2.II.1.b (Control Discharges from Ship's Bilges) and CNO (OP 45) Requirement I.1 (Oily Waste Management for Ships). An environmentally sound, in situ bioemulsifier (i.e., Emulsan ™) cleaning process was developed using a 1 gpm OWS and oil content monitor for the effluent. Emulsan™ is safe to use for cleaning OWSs on surface ships based on an assessment done by the Naval Environmental Health Center (NEHC/Norfolk, VA).

NRL is working with NAVSEA 03V11 (life cycle manager is Mr. Al Belfield) and NSWCCD/Philadelphia on using the Emulsan™ cleaning with a 10 gpm OWS Fall 1998.

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For more information contact:
Dr. Joanne Jones-Meehan
202-404-6361, jonesmee@ccf.nrl.navy.mil